Fruit and Produce

VOL. IV., No. 1
APRIL, 1949

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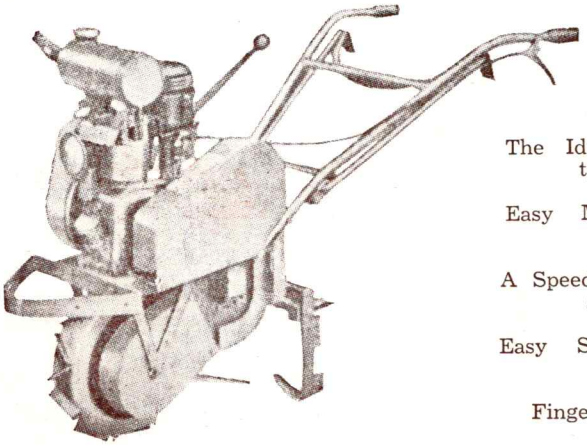

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Value of Working Together

— EDITORIAL VIEWPOINT —

SEVERAL factors contributed to some uneasiness in the minds of North Island stone-fruit growers at the outset of the recently concluded marketing season. It was well known that all jam making and processing factories had a substantial surplus of fruit pulp carried over from the previous season, and that consequently they would not this year be operating to any appreciable extent, if at all. Even though the Auckland districts crop was reduced by unfavourable weather conditions to small proportions, Hawke's Bay anticipated a record crop.

But contrary to what might at one time have been expected, the results of this season's marketing operations must have given complete satisfaction to growers. A large quantity of stone-fruit has been distributed at generally good prices. This result, however, has not been achieved "out of the blue." It comes from the best kind of co-operative effort between growers and distributors.

In the early part of the season a largely attended meeting of local stone-fruit growers was held in Hastings. Reports tabled at this meeting clearly disclosed the fact of a near record crop: and naturally there arose the question of how to market such a crop. A further meeting was held to which the local distributors were invited so that their views could be expressed. As a result of this joint meeting an advertising campaign was launched to the cost of which both growers and distributors contributed: arrangements were made by the local distributors for forward sales at payable prices of the more prolific varieties. An information bureau was set up in Hastings which was able to give useful and indeed necessary information to growers as to

prices ruling in and anticipated quantities going forward to the various market centres. The Railway Department by instituting a motor truck service from Hastings through to Rotorua, and thence around the Waikato area, very greatly assisted marketing operations. We feel that the joint efforts of growers and distributors were largely responsible for the institution of this new and beneficial service.

We offer our sincere congratulations to all concerned in this successful joint effort: to those responsible for calling the two groups together in consultation, as well as to those who made and carried through the various arrangements. The result will surely be that this joint effort not only will continue, but also will be extended in the future for the great benefit of all sections of the Fruit Industry.

★

• Imported Fruit Containers for Vegetables

At the recent Arbitration on container charge dispute, a great deal of information was supplied by vegetable growers indicating how valuable imported fruit cases were used by the commercial gardeners. Banana cases, in particular, were quoted as being indispensable to the industry.

★

• Container Charge

The question of whether or not container charges should be continued, was decided by the sole arbitrator, Mr. G. G. G. Watson, barrister of Wellington. His decision is that container charges on a simplified form shall continue for both bags and cases.

It is to be hoped that the parties to the dispute will co-operate in implementing the decision, and that peace and harmony will prevail in the industry from now on.

★

• Winter Drop of Grapefruit

One of the major problems confronting growers of grapefruit in Victoria, the heavy winter drop of fruit, may now be successfully combated by the use of dilute sprays containing the well-known "hormone weed killer" 2, 4-D. In tests carried out by the Victorian Department of Agriculture in various parts of the State, use of this spray reduced the winter drop of grapefruit by as much as 90 per cent. The spray material is not costly.

The recommended spray contains 22 parts per million of a sodium salt of the "growth substance" 2, 4-D. One pint of summer white oil is used as a spreader and sticker. The spray is best applied late in May, when autumn growth has ceased, and the spray material should be so directed as to thoroughly wet the calyx of each fruit.

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NURSERYMEN

NEW PLYMOUTH

G.O.M. of Horticulture

From the New Zealand Free Lance

THE "grand old man" of New Zealand horticulture, Thomas Horton, New Plymouth, who in 1897 introduced the Delicious apple to New Zealand from Chicago, retired in March. For the last quarter of a century he has been superintendent of Pukekura Park, New Plymouth, one of New Zealand's most beautiful native parks and recreation grounds.

Now in his 82nd year, Mr. Horton has had an active career that has taken him round the world and into ambitious enterprises.

New Plymouth is proud of its Pukekura Park, but no one is prouder of it or has done more to develop it than Mr. Horton. Pukekura Park's fame has earned him a prominent place in the horticultural world. But long before he took over its affairs in March, 1924, his knowledge and ability were known in various parts of the world through his wide business associations.

Strenuous Years

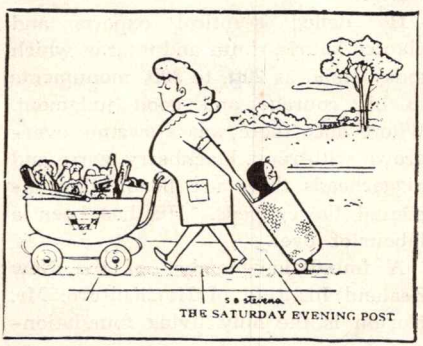
Born in Warwickshire, England, in 1867, Mr. Horton came to New Zealand with his parents in 1874. He was educated at Rangiora, Canterbury, and at the age of 11 was apprenticed to a Christchurch nursery. At 21 he became manager of a North Island nursery, and after seven years he decided to set up on his own account as a nurseryman.

Working in his spare time he stumped and cleared an area at Pahiatua, but later he purchased 178 acres of land at Hastings, where he established the Frimley nurseries, which soon gained a Dominion-wide reputation. After seven years he was employing a staff of 97, and seven travellers, with agencies throughout the country.

Concentrating upon fruit trees, and apples in particular, Mr. Horton exported millions of trees to Australia, the Argentine and South Africa. He catalogued 700 varieties of apples alone, and each year he visited Australia in search of new varieties. He made three world-tours, each time bringing home new and rare plants he thought might be useful to New Zealand.

Visiting England in 1906, Mr. Horton gained by examination the diploma of the Royal Horticultural Society. A comprehensive exhibition of fruit he took with him won the Hogg Memorial Medal.

Perhaps the highlight of his business-career came in 1910, when he was invited by the Government of Paraguay to give advice on fruit culture. He took the opportunity to travel extensively in South American countries. He realised the potentialities of South American markets, and one of his first moves was



to open an agency at Buenos Aires through which hundreds of thousands of New Zealand fruit trees were distributed..

Revisiting the Argentine in 1914, Mr. Horton held an exhibition which produced many orders, but before they could be fulfilled war broke out, and ships that had worked between New Zealand and Buenos Aires and Montevideo were diverted. To keep faith, Mr. Horton chartered a ship, which left Napier in 1915 flying his own house-flag bearing his advertising slogan "Horton's Trees Grow."

However, heavy costs crippled the trade and eventually Mr. Horton abandoned it. The war caused him setback after setback, but the final blow came when the Government abandoned a scheme to assist returned servicemen to establish fruit farms, and Mr. Horton was forced to burn 2,300,000 trees.

Proved His Point

After two years of travelling, Mr. Horton accepted his present position, intending to stay for two years. He found Pukekura Park in a neglected and backward state, but in spite of many difficulties, financial problems and labour shortages he has developed it into one of the finest parks of its kind, containing native trees and shrubs and flowers from many parts of the world.

He defied sceptical experts and planted kauris, rimus and totaras, which today stand as 20ft. to 30ft. monuments to his courage and good judgment. Where once there was a swamp, overgrown with rapu, blackberry, gorse and niggerheads there are beautiful ornamental flower beds. His has been a labour of love.

A foundation-member of the New Zealand Institute of Horticulture, Mr. Horton is the only living foundation-member of the New Zealand Horticulture Trades Association. He has won many gold medals and awards, two of note being the gold medal he won at the Christchurch Exhibition in 1906, when he beat a Canadian display, and the gold medal and £50 prize offered by the Australian Federal Government he won by outclassing a Victorian entry.

Upon his retirement members of the New Plymouth Bowling Club can look forward to seeing more of "Tom" Horton, who in spite of his 80-odd years is a bowler of more than ordinary consequence.

★

Wit and Wisdom

Gus says some men are always punctual in being late.

* * * *

Boss: Can you type?

Applicant: Yes, I use the Columbus system.

Boss: What's that?

Applicant: I discover a key, then land on it.

* * * *

Our lives are so interwoven with, and dependent upon, one another, that we cannot achieve happiness if other members of our community are in misery.

* * * *

In the past the ordinary man, even if he did not like art, could understand it. Now he cannot even understand it.

*

"Well," said the husband, as his wife drove the car into the garage with another fender dented, "I see you had the right of way again."

* * * *

There are three major parties in the United States: The Democratic Party, the Republican Party, and the Cocktail Party.

● **Methodical mating vital to improve quality, size and flavour.**

Breed Asparagus Like Cattle!

By A. W. Kidner in The Fruit Grower

ONLY by the methodical control of fertilisation of the plants can there be any hope of achieving any improvement in the flavour, quality, uniformity and size of asparagus.

Think of asparagus like beef or milk. Cattle are bi-sexual — but so are asparagus crowns; and asparagus must be bred and controlled on exactly the same principles as cattle are bred to improve the quality, flavour or quantity of beef or milk.

Controlled breeding of cattle was practised very successfully long before Mendel was born; he did not discover the principles of breeding bi-sexuals, he only explained how they functioned, and so enabled breeders to apply them more effectively.

In 250 years cattle have improved tremendously, due entirely to the control exercised over their mating: yet during many centuries of intensive and careful cultivation, no one appears to have even thought of applying those principles, **in their entirety** at least, to the similar breeding of bi-sexual asparagus crowns.

I purposely emphasise "in their entirety" because many growers have spasmodically selected and mated two individually good crowns, in the expectation that their progeny would be as good as, and perhaps better than their parents. Any knowledge of genetics shows this to be merely a foolish and futile expectation.

Astonished at Progress

A leading research worker in asparagus in the U.S.A. recently wrote to me expressing astonishment at the continued and uniform progression my pedigree strain had made during the last 20 years, and said: "We at this station have also been breeding asparagus for 20-25 years, trying to produce better strains; yet, despite a great amount of meticulous research work in recording and observing many thousands of individual crowns from which to choose parent crowns, we have no better strains today than those from which the original selections were made. Indeed, most of them are not even as good as the originals were."

● **Good Profit in Linseed**

Queensland farmers who planted linseed early for a guaranteed price of £40 per ton, will reap a good profit for their foresight. They are going to get £82 a ton for all the new crop that shows a 40 per cent oil content.

To one steeped in the atmosphere of cattle-breeding, the answer is simple and obvious. They had not in fact been "breeding" at all, but merely mating two completely heterogeneous individuals. Despite all the care given to the selection of the particular individuals, this remained purely promiscuous fertilisation, and could not lead anywhere, unless simply used as the foundation mating from which to begin to breed and develop a strain.

The stumbling-block over which growers, seedsmen and research-workers invariably fall, seems to me to

be misunderstanding of the vital part heredity plays in the life cycle of the asparagus plant. I cannot go back to the beginning because I don't know where or what it was. Did the seed come from the crown or the crown from the seed? For the sake of a start from somewhere, we will take the seed—though we shall at once find that it is evidently not the beginning of asparagus life.

Seed is produced by the female crown but she possesses only half the necessary ingredients; the other half she must obtain from a grain of pollen from a male plant. She then combines these separate inheritances and produces the seed which, in due course, provides a young crown. It would, perhaps, be truer to say these two inheritances combine themselves together under the care and protection of the mother plant.

All this is merely primitive knowledge, but it is the vital key which opens the door to all control by the would-be breeder; for, once the combination of these two different and separate inheritances has been effected, the development of the mixture is beyond our control. We do not "grow" the young crown; it grows by its own inherited ability—for heredity is all that a plant (or animal) is, or has, to start with.

There are many types of asparagus buds, some very desirable, others quite objectionable; among the desirable ones are the dark green buds with a touch of purple, having a close, slightly rounded head; this type is most popular and has many names, such as "Argenteuil," "Bedenham Purple Giant," "Reading Giant," "Palmetto," etc. There is also a type with a light green colour and sharply pointed tapering head which is inclined to open quickly: this is the type Conover liked and called "Colossal." The objectionable types have short, coarse stems, open bracts, or wiry and wooden stems with open heads.

The asparagus crown will only produce its own individual type, which its inherited ability enables it to produce. No cultivation, manures or soil can make it produce any other type. This being so, it should be obvious that if we desire a crown to produce a certain type we must ensure, as far as we can, that its inheritance is such as to enable it to produce that type. It is only through its heredity that we can exert any influence.

This calls for the selection and mating of the two parent crowns, and both must themselves have inherited the ability to produce the type we desire. It is at this point we encounter the first difficulty.

● Guaranteed Price

Legislation to stabilise the Tasmanian fruit industry is sought by the State Fruit Board. The Government is asked to guarantee a minimum price per case at packing sheds and to fix a price for factory fruit.

G. C. Hanna, head of the research department in California University, writing on "Asparagus Production in California," says: "Seeds selected from high-producing plants of the desirable types do not come true, but they should produce better plants than seed selected at random."

Is it not surprising that recognition of such an important weakness should excite no desire to remedy it, more particularly when the remedy is both obvious and practicable?

To me, at least, it is inexplicable; as a stock-breeder my very first reaction, on discovering that asparagus plants were of distinct sexes, was that they

must be bred as cattle are bred. How else could I expect good seed, other than by using the right male on the right female?

The very first essential and obvious precaution in cattle-breeding is the emasculation of all unwanted males. Yet all asparagus males are allowed to grow up and have free intercourse with all the females—which, to say the least, is hardly conducive to their physical improvement.

It surely needs no unusual gift of imagination, or highly-trained mind, to associate bi-sexual cattle with bi-sexual asparagus. Both must have a mate; both obtain their dual inheritance in a very similar manner; both propagate their species by similar means—the one by a calf, the other by a seed, virtually the same thing.

A glance at any asparagus bed shows poor males and poor females in permanent occupation, and breeding equally poor specimens. Can any good possibly come out of this?

Greater Individuality

Being dioecious, the asparagus crown has, because of its dual inheritance, a much greater distinctive individuality than any monoecious plant whose parents are one and the same. It is virtually different, too, from the a-sexual plant, or that which is reproduced vegatively. Due to its ever-changing inheritance, each succeeding generation differs materially from the preceding one.

Yet, so little thought and observation has been given to these indisputable facts, that growers, seedsmen, and horticulturists will buy, sell and recommend "varieties" such as "Conover's Colossal," "Argenteuil," "Mary Washington," etc., as though these were distinct varieties of distinctive types within the species "asparagus," which would reproduce in their progeny their distinctive qualities.

I was recently shown a chart drawn up by a horticultural society, purporting to show the lineage of all the present-day varieties in direct descent from the original Violet Dutch, the "ancestor of all known varieties," born in the 17th century.

Being "on the carpet" for expressing my view that there could be no such thing as a "variety" of asparagus in the commonly accepted sense, I was asked to explain how such an authentic chart could be drawn up if there were no varieties. I said I did not know—but that, it seemed, was no answer. After

FREAK NECTARINE

From our Hawke's Bay Correspondent

A BOTANICAL freak of nature in the form of a tree which is producing fruit which are part peach and part nectarine has aroused interest among the friends of Mr. E. A. Clark, Havelock North.

An expert was engaged by Mr. Clark about two years ago to work on to a branch of a Goldmine nectarine tree a bud taken from a Golden Queen peach tree. Now the first fruits on the budded wood, which have been harvested this year, are typical Golden Queen peaches except that about one-third of each fruit has the colour, flesh texture and flavour of a Goldmine nectarine.

Obviously the stock has had some influence on the bud worked into it. Such an influence is most unusual, and in the instance of Mr. Clark's tree the result suggests some complicated botanical reaction.

Originally, of course, the nectarine was developed from a peach. It originated from a sport taken from a peach. Since then the nectarine has been improved as a distinct fruit with a number of varieties.

being assured that descent was traced through the female line, I explained that in my view "Violet" herself could not have known who her father was, and her mother had no marriage lines: more, she did not know who were the fathers of her many children. All her descendants were in like case, and I just did not know how an authentic lineage could be traced through a "line" of prostitutes, themselves untraceable. The principles of intercourse between humans and asparagus are similar, and I believe the corollary is sound.

It would be a waste of time discussing how to breed asparagus before the need is fully and clearly realised—and proof that this is not so is furnished by the world-wide interest taken in the respective merits of male and female asparagus crowns.

Californian research into the merits of individual crowns showed that the male crown often surpassed the female crown in productivity of buds. This was seized on with avidity by horticultural societies and especially by writers on asparagus. It was a very "widow's cruise" of inspiration, providing a theme whose only limits were the tastes and fancies of the writers—as long as they carefully avoided all reference to the breeding and raising of male crowns only. This they quite happily did.

It could be as logically argued that a nation, threatened with war, should breed and raise only men; or that steers —being better producers of beef than cows or bulls—should alone be raised. My own experience convinces me that, in fact, females are more profitable than males, for they produce rather larger buds which are also, usually, of slightly better quality. Covent Garden willingly gives a good deal more for something only a little better!

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Disease of Apples

From our Hawke's Bay Correspondent

APPLE virus and woolly aphis have been troubling Hawke's Bay fruit-growers this season. The apple virus is showing up throughout the district, particularly in susceptible varieties such as Jonathan and all types of Delicious. Many other varieties are affected to a lesser extent.

Symptoms of apple virus are chlorotic yellowing or discolouring of the foliage and dwarfing of the foliage and growth. The amount of virus has been particularly apparent recently during a search of the district for trees for certification for bud selection purposes. As it is a virus disease, it is being recommended that steps should be taken to locate trees for budwood which are entirely free from the trouble. There is a danger that buds taken from affected trees will only perpetuate the trouble.

The disease is a newly defined one in apples, and although it is fairly widespread in most orchards today, growers are being told that they need not be unduly perturbed. Despite the infection, the trees continue to produce economic crops although the life of the trees may be curtailed. Every precaution is being taken, however, to safeguard the interests of growers carrying out new plantings by the production of nursery trees from healthy material.

Woolly aphis has been a real curse in district orchards, infection being particularly severe in varieties such as Cox's Orange, Kidd's Orange Red and Sturmers. Although it is fairly generally felt among commercial growers that the influence of D.D.T. in killing off the parasite, which travels under the entomological name of aphelinus mali, results in an upsurge of woolly aphis infection, there is yet insufficient evidence to prove that this is strictly correct.

The pest has been gradually developing in Hawke's Bay orchards over the past three or four years, a trend which often occurs in relation to parasitic control. At present the parasite is very active and although late in this respect, growers are hopeful that it will shortly bring the aphis under control. The rapid build up of the parasite now suggests that better control will be obtained next season provided it starts work reasonably early.

Until there is evidence to show one way or the other whether D.D.T. is causing mortality to the parasite less D.D.T. will probably be used in orchards.

This year the woolly aphis is so dense around the stem cavity of the fruit, particularly on Sturmers and some Delicious, on the stem itself, and on the spur and adjoining lateral that it has robbed the material in the affected area of so much energy that the fruit has developed prematurely and dropped off.

★

● **Air Freight**

During 1947, Australian National Airways carried 23,510,379 lb. of air freighted cargo. Many primary products, including fruit and vegetables are now being carried by air.

● By Mr. C. Horth, Fruit Instructor, Hawkesbury Agricultural College, Richmond, N.S.W., in an interview with Mr. Bernard Carter.

Planting Out the Orchard

From the Queensland Producer

CARTER: Are you thinking of planting a young orchard, then I bet you have been trying to gather all the information about the subject and inquiring of experts how to go about it. Well here is another expert to help you with a lot of your problems and maybe put you wise about some mistakes that we all make—Charlie Horth, Orchard Expert at Hawkesbury College, is telling us how to set about things when we plant a young orchard. The thing we want to know is the preparation of our land, and when should we start it.

HORTH: Well the preparation of the land should be carried out fully 12 months before you think of planting, it needs fairly good working, but essentially deep working, but if it is newly cleared land it is advisable to work it deep enough to get rid of the roots and if there is any hard pan of any type—to break it up.

"I'll run along, Ed—you're busy and I'm probably distracting ya."

CARTER: Well just imagine all the same that we had all the problems in the world, for instance we have a big slope there and all our top soil may wash away—what do we do then?

HORTH: There is only one thing to do. It has been most evident in the last few years, that contour planting is here to stay, and it is the only way to save your surface soil, and actually with your contour planting you improve your land rather than actually letting it run down hill.

CARTER: That means to say that we have got to think about our soil stability.

HORTH: Yes, there is some exception to contour planting because there is the variation in the width of rows and the possibility of losing less than the usual accepted number of trees to the acre. We find nowadays that you can easily get over the difficulty of number of trees to the acre; there is a tendency among growers to do what we call double planting. You adopt the ordinary difference between the trees, that is 22ft. or 24ft. which you plant at double the space along the line. Of course the distance between lines will vary, but it is usual to keep the minimum distance. Say if you were making a 22ft. planting, it would be usual not to go any closer than 20ft. or if the distance exceeds 30ft., well then it would be a case of, shall I plant another row 15ft., or should I wait until it gets a little wider.

CARTER: Now when we have decided

on spacing we must dig our holes well ahead of planting time?

HORTH: Well, I wouldn't say that. Actually you should be preparing land 12 months ahead with cover crops that can be turned under, or the cover crop can be left and just the lines to be planted can be worked up a little while before. It is really better to dig the holes just ahead of planting. If opened before you will find the soil moist and the hole quite likely to dry out, the soil is dry and will set hard and then there is the question of when you are planting you can't plant dry, you must plant moist. On the other hand it is not advisable to plant wet, because some of the heavy soils crumble very easily. The holes should be about one foot to 15in. round and one foot deep, depending on the size of the trees and the root system, with a little surface soil chopped up finely with a spray and put back into the bottom of the hole. Then sit the young trees on that soil taking good care to place the roots well. Pretty well in the same position as they have been growing in the nursery, don't bunch them together in one heap or flatten them, place them well round so that the tree is well supported.

CARTER: Now what sort of young trees shall we order—year old buds?

HORTH: You can get old buds; sometimes they are not available and the nurserymen may offer dormant buds. There is a lot more work entailed with dormant buds, but of course there is always the question of taking what is available. In these times of shortages, trees are by no means plentiful. It is usually necessary to order sometimes two years ahead to be sure of getting them. The one year old bud is better, provided the trees are well grown, which is the main thing—good strong vigorous trees without being too big. Some of the trees we grew under irrigated conditions at Yanco grew so big and heavy that they were far too big actually to plant. When it came to lifting them from the nursery, too much root was left behind. The trees didn't make anywhere near the growth the smaller trees did.

CARTER: Would you recommend any special way to lay your roots?

HORTH: Mainly to eliminate the tap root. That needn't go straight down, it can be cut off at a convenient depth, say about 6in. to 9in. If one or two main roots are coming away from the crown, space them so they will support the tree from the windward side. Put the strongest root into the windward corner and that will help to take the tree out into that windy corner.

CARTER: Lots of fellows cut back rather severely, is that a good thing?

HORTH: No, it is not, you shouldn't cut back more than is absolutely necessary, it is well to keep in mind one of the main principles of pruning—if you want to spread a limb or tree,

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"Ah, now for another short day at good wages, among pleasant surroundings and excellent working conditions with splendid opportunities for advancement."

then cut it. The harder you cut the more you spread it. On the other hand, if you want to encourage growth, give it all the length possible, and if you want to balance it up in comparison with some of the heavier limbs, cut the heavier ones to spread those but leave the weaker ones, and give it a chance to catch up with the other stronger growth.

CARTER: Now will you agree Charlie that soil management is changing just as preparation of the land for orcharding is changing?

HORTH: Yes, we find that the idea of clean tillage and constant working of the soil, even during the growing season, only ends up in straight out soil deterioration, just another angle on the erosion loss incurred through not planting on the contour. With the young trees we carry out what you call the strip cultivation. We just work a strip on either side of the young tree about 3 or 4ft. during the growing season. During the winter cover crops for the volanteer weed growth which is of a good type is allowed to grow right up the tree. As the trees age and get bigger there is more need for nitrogen during the growing season; that is one of the reasons why we keep that strip near the trees clean, not so much to reduce weed growth as to cut out competition for nitrogen. The moisture is not the limiting factor, it is one of the factors, but nitrogen is the over-riding factor of the lot.

CARTER: You attach a lot of importance to cover crop?

HORTH: Yes. Particularly if you are able to carry out a permanent cover which is the ideal type of management. On the other hand that is not always possible—an annual crop is most essential.

Smile With Us

★

Principal Sam Woods: "Bobbie, your composition is the worst in the class. I am going to send your father a note."

Boy: "You'll just make him sore; he wrote it."

* * * *

Don't Ask Questions

A Des Moines home-owner, wearing his oldest clothes, was mowing his lawn when a woman in a ritzy car stopped and asked him: "What do you get for mowing lawns?"

"The lady who lives here lets me live with her," replied the home-owner, and the lady in the car, without comment, drove away.

* * * *

The Scotsmans returned to his table in the restaurant with a very red face. He said he thought the sign over the door read "Laddies."

* * * *

Lucky Break!

AN American train was travelling on one of the branch lines, when suddenly the engine left the rails. A negro porter, who had been standing by a window in the saloon, was thrown through the glass and flung some dozen yards through the air before he was brought up short by crashing his head against a concrete post.

For a few moments he lay dazed; then he sat up, ruefully rubbing his head.

A crowd of passengers was quickly on the scene.

"Good heavens," said one of them, "aren't you dead?"

"No," replied the negro slowly. "Ah reckons that concrete must have broken ma fall."

* * * *

Hollywood marriage—the period between "I do" and "adieu."

● **Elaborate developmental plans in view.**

Property for Research

VALUABLE HAWKE'S BAY SITE

From our Hawke's Bay Correspondent

PLANS to extend research into problems with which fruitgrowers and market gardeners in Hawke's Bay are faced are visualised in proposals for the development by the Department of Scientific and Industrial Research of a 24-acre block of land at Havelock North. Ultimately the area will replace the present totally inadequate 5-acre research orchard owned by the Hawke's Bay Fruitgrowers' Association and used by the Fruit Research Section of the S.I.R. Department for experimental purposes.

It is understood the Department has elaborate developmental plans in view so that the new area should ultimately become not only a valuable research station, but a show place which should be an asset to the district as a whole. The purchase of the property at a cost of £3370 was effected in the first place by the local Fruitgrowers' Association on behalf of the Crown which now holds the title deeds.

Acquisition of the land from the Vernon Estate culminated a long quest by the association. For some years members had felt that the existing research orchard was completely inadequate. The work which could be carried out by research officers was in no way commensurate with the importance of Hawke's Bay as a fruitgrowing district. It was soon found, however, that suitable blocks of land were at a premium and year by year passed while growers' representatives reported lack of progress to the annual meetings of the association.

When the Vernon Estate came on to the market it was readily appreciated that the 24 acres offered an ideal site for research purposes, because of the varying soil conditions. Initial overtures of the Fruitgrowers' Association aroused a storm in a tea cup. The Havelock North Town Board opposed the purchase on the grounds that the land was within an area valuable for building sites. The subject was taken to higher quarters, and the Hawke's Bay fruit industry witnessed the spectacle of two Ministers of the Crown openly expressing their difference of opinion.

As the Minister controlling the Dept. of Scientific and Industrial Research, Mr. Nordmeyer held firm in the con-

"McTavish always was a sucker for all the latest styles."

tention of his interested officers that the site was the only suitable one available. On the other hand the Minister of Agriculture, Mr. Cullen, as a member of Parliament for the electorate, sided with the Town Board. After protracted wrangling the upshot of the negotiations was that the purchase was finally made by the association, acting as agent for the Department.

At present the property is in a rough state, but it is expected that the Department will begin shaping it to its requirements during the coming winter. Existing buildings on the property are to be dismantled and salvaged materials used to erect such facilities as implement sheds essential in the initial development of the area. Housing for workers on the property and laboratories will come later.

Planting of the area is expected to begin this winter. Already a small portion of the land has been put into use. When Mr. Nash, director of hop research returned from England recently, he brought with him a number of new varieties of hops. These are being propagated in isolation for a year on the new research area, the desire being to keep them away from the recognised hop-growing areas of the Nelson and Motueka districts, so that there is no possibility of their being attacked by hop pests and diseases already established in those localities.

When in full operation the new block will be used for research into the problems of small-fruit growers and market gardeners as well as those of men engaged in the pip and stone-fruit industries. It is probable that at a later date the Fruit Research Section of the Plant Diseases Division will transfer its headquarters from Auckland to Havelock North.

● **Need for more experience**

Bledisloe Cup for Packing for Export

From our Hawke's Bay Correspondent

FOR the first time in the history of the Bledisloe Cup for fruit packed for export the cup has been won by a North Islander. He is Mr. A. A. Lambert, Hastings, who packed Red Delicious (dessert) and Ballarat (cooker) to win the trophy when it was competed for at the Hawke's Bay Agricultural and Pastoral Society's autumn show for the first time.

Entries were disappointing, there being only nine. One competitor's exhibit was disqualified and two entries did not come forward so that there were only six finally before the judge, Mr. T. Conway, orchard instructor, Department of Agriculture, Hastings.

The possible total points were 100. Results were:—

A. A. Lambert, Hastings, 88 pts. 1
L. O. Bousfield, Hastings, 81¼ pts. 2
R. E. Bixley, Hastings, 74 pts. 3
T. H. Hassell, Hastings, 72 pts. 4

The winning entry, in the opinion of the judge, was commendable as it showed evidence of the right competition touch and attention to detail which was so important in an event of this kind. New Zealand could be proud of its export fruit if it was always up to the standard demonstrated by Mr. Lambert. Mr. Bousfield's entry was also a really good one.

Mr. Conway considered two or three of the entries showed a lack of care in regard to important details such as blemish, bruising, type of colour, sizing and alignment of the pack. These deficiencies indicated a need for more experience in this type of competition.

● **The raising of cape gooseberry seedlings is carried out in much the same way as the raising of tomato plants.**

Cape Gooseberry Culture

From The Fruit and Vegetable Review

THE cape gooseberry is a native of Peru and belongs to the family "Solanacea" in which are included the tomato, the potato, and tobacco. The family is, of course, quite distinct from the one in which the English gooseberry is a member.

Two types of cape gooseberry are grown, the more common being the small-fruited, yellow variety, the berries of which measure half an inch or a little more in diameter, while the other is the Golden Nugget variety (probably the variety edulis), which bears slightly larger fruit. The small berries of the former are usually preferred because of their superior flavour, but both varieties make good jams and preserves.

The plant itself is a non-woody shrub, commonly growing to a height of three feet and having a spread of five to six feet. It is characterised by its habit of bearing fruit enclosed in an inflated calyx, the "husk." Though the plant is a perennial, it is in common practice almost invariably cultivated as an annual in this State. Under south-eastern Queensland conditions it will grow vigorously in spring, summer and autumn, producing its main crop between May and September.

Climatic and Soil Requirements

Growing conditions and cultural practices required by the cape gooseberry are in many respects similar to those suitable for tomato culture in coastal districts. The plant is favoured by a warm spring and summer climate with abundant rain, but relatively dry weather is desirable during the maturing and harvesting of the crop. Severe frosts may kill most of the above-ground portion of the plant.

The most suitable soils are sandy loams and loams, but, provided there is free movement of water through them, the plant makes good growth on a rather wide range of soil types.

The plant is propagated from seeds, and the raising of cape gooseberry seedlings is carried out in much the same way as the raising of tomato plants. Germination, however, is inclined to be slow and irregular, and the percentage of seeds which eventually germinate is normally rather low; hence an ounce of seed is usually required to provide sufficient plants for an acre. Seed-beds can often be successfully established by squashing the fresh fruit and scattering the seed in the soil.

Plants are raised in well-prepared seed-beds in which the seed is covered by a shallow layer of soil containing a good percentage of dried horse manure to prevent caking of the surface. The seed-bed should be kept moist, but shading is not usually necessary. As the seedlings grow they should be either thinned or pricked out into nursery beds in which the rows are three to six inches apart and the plants two to four inches apart. Eight weeks or more after sowing the seedlings should be ready for transplanting in the field, but they should first be hardened

off by gradually reducing the water supply. Just prior to lifting they should be well-watered to soften the soil.

Planting Out

Planting out in the field should, of course, be preceded by suitable soil preparation, including the supplying of organic matter in the form of a green crop, and appropriate cultivation. Planting distances range from five feet by five feet (1740 plants per acre) to eight feet by eight feet (680 plants per acre) eight feet by 10 feet (544 plants per acre) according to the fertility of the soil and the method of cultivation. If horse or tractor-drawn implements are to be used in the early stages of plant growth, the widest spacing is most suitable. The plants are set out in late summer or early autumn, early planting being regarded with disfavour in some localities because such a practice renders the crop more liable to attack by corn ear worm. The cape gooseberry has a large proportion of its feeding roots near the surface of the ground, and as these roots spread across the rows, cultivation with implements must be correspondingly reduced. Light cultivation with hand tools should suffice for weed control during the later stages of growth.

Fertilising

A basal application can be made by opening a furrow along the row to be planted and then spreading, over a distance of about two feet, four ounces of a mixed fertiliser at each point where a seedling is to be planted. After turning another furrow, a plant can be set at each position where the fertiliser has been placed. A basal dressing can also be applied by opening a hole with a hoe or some other suitable tool, spreading and mixing the fertiliser in it and then planting. Some growers apply fertiliser by topdressing soon after the plants become established and chipping the mixture into the soil with a hoe.

Suitable mixtures for use in this application are those containing 5-8 per cent nitrogen, 10-15 per cent phosphoric acid and 5-6 per cent potash.

Topdressing with sulphate of ammonia or with the above mixtures, when the plants are about half-grown, is practised at times with beneficial results.

Harvesting and Marketing

The crop will begin to mature approximately three months after planting out and harvesting may extend over a period of a further two to three months. Maturity of the berries is indicated by the changing of the husk colour from green to pale brown, and at this stage the fruit begins to fall from the bush. It is considered preferable to gather the fruit from the ground rather than to pick it from the plant, as this ensures a maximum degree of uniformity in its colour and maturity. The gathering should be done at regular intervals, and in the course of this work it is well to jar or shake each plant so that all mature fruit will fall to the ground.

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● **The processing plant is the hub of this vast organisation**

The World's Largest Market Garden

J. R. Ashton describes some of the methods employed on Seabrook Farms, New Jersey. These growers have their own research team to maintain high production to ensure an even flow of produce to their freezing and canning organisation.

From The Grower, England

STARTING in a small way, Mr. C. F. Seabrook, now helped by his three sons, controls Seabrook Farms, operating 19,000 acres of farmland, Deerfield Packing Corporation processing 65,000,000 pounds of frozen and 10,000,000 pounds of canned foods; the Cumberland Warehouse Corporation with a storage capacity at minus 10 degrees F. of 65,000,000 pounds, and the Cumberland Auto and Truck Co. for carrying frozen goods to distribution points.

The processing plant is the hub of this vast organisation around which is built the community housing the 2000 permanent employees and the 3000 seasonal workers, with hospital, school, dining rooms, welfare centre, shops and P.O.

Most of the seasonal workers are migratory, moving north from Florida and other southern States as the season begins and returning in time for winter production in the South.

Production at all stages is strictly controlled and careful planning is necessary to ensure an even flow of clean, top quality produce to the processing plant.

The farm is divided into eight divisions, each with its own manager. In addition to this there is an apple orchard of some 200 acres and a large nursery producing large quantities of rhododendrons, azaleas and shrubs.

Scientists under the direction of Dr. Frank App, complete with modern laboratories, are responsible for pest control, soil testing and maintaining fertility, and a resident climatologist, Dr. C. W. Thornthwaite, is consulted about planting schedules.

Aeroplanes operating from the firm's aerodrome are used for spraying and dusting, and large modern workshops maintain and construct some of the processing and farm machinery.

Division managers and key technicians are provided with cars or trucks fitted with two-way radio and are in constant touch with the Central Station at farm H.Q.

Last year 2,000,000lb. of seed were used and strains and varieties have been decided upon after continual field tests. Crops grown are sweet corn, Lima beans, kidney beans, peas, rhubarb, broccoli, spinach, carrots, asparagus and beetroots, all of which are processed.

Farming in New Jersey has many problems, such as soil erosion, with which the English farmer is not familiar, and on this sandy soil full consideration must be given to humus content as well as fertiliser needs and pH value.

Constant tests are made in the laboratory to find the needs for various crops.

The basic fertiliser generally used is NPK 4-12-8, to which is added the trace

elements, borax and manganese. This 1-3-2 ratio was selected because fertiliser practices of many years past have allowed phosphorus reserves to fall very low in South Jersey soils.

For special crops or heavy feeders, such as spinach, additional nitrogen is added, either by top dressing or ploughing under. In soils where phosphorus and potash reserves are significant a 10-10-10 fertiliser with added borax manganese is used.

Organic Preferred

Fertilisers are made up by the manufacturers according to Seabrook's specification, with no large amount of nitrate nitrogen in any of the formulæ. The bulk of the nitrogen is derived from ammonia forms, or synthetic organic material such as cyanamide, which are less liable to leach.

Pest control is an important factor in producing clean maximum crops for processing, particularly in this area, and the entomologist inspects the crop at regular intervals and decides when dusting or spraying is necessary. This is usually done by one or all of four aeroplanes as necessity demands.

Pea aphis is controlled by using a rotenone oil-bearing spray known as "Vapona," marketed by Shell Oil Co. Mexican bean beetle is a serious pest and is controlled by rotenone, hoppers by lethane, red mite by sulphur. Prophyllite is the dilutent, somewhat similar to talc.

Spraying by Air

The planes work at 80 m.p.h. and cover a width of 30ft. in one run. Cost of application is around 5/- an acre, exclusive of dust or spraying material.

Forty to 50lb. of dust or 5-7 gallons of spray are applied an acre and one aeroplane can treat 100 acres in 1-1½ hours.

Farm operations are highly mechanised and much of the work is done by machinery developed in the farm workshops. Peas are sown at the rate of 280-320lb. an acre, by grain drills, in rows 7in. apart.

The only cultivation before harvesting is effected by a rotary hoe, which is drawn at an angle across the pea rows. This loosens the top soil and destroys small weeds. Peas are harvested by the Hume Love harvester and the Porter Way harvester.

The Hume Love is used for opening out and has a side delivery; the windows are loaded into trucks by means of a crop loader unit attached to the rear of the trucks.

The Porter Way loads direct into the trucks and is a recent development. This machine is also used for spinach.

Pea harvest is one of the busiest seasons on the farm and a 24-hour day is at times essential. Portable, self-contained generating units with lamps mounted on platforms are moved about the fields so that harvesting can continue all night.

As soon as the wines are cut they are rushed to vining stations, which are strategically situated on all farm divisions. In the threshing machines the "hard" peas are kept separate from the better quality "soft" peas and the vines are used for cattle feed.

Pea Testing

Within a short time the peas are received at the processing plant where samples of the load are subjected to quality tests. A sample of both "hard" and "soft" peas are placed in a "Tenderometer," which registers the amount of pressure required to crush about one pint of peas.

From this the tenderness is determined. Samples are also run through a

cleaning and grading plant which is a miniature of the processing plant right up to the packaging stage.

Included in this process is a brine separator which allows the young tender peas to float and the more mature peas to sink.

All peas, whether grown on contract or produced on the farm, are subjected to this test and it is by this standard that contract farmers are paid.

In addition to the thousands of acres producing on their own farm, Seabrook contracts out for a similar acreage in the vicinity and in the neighbouring states of Delaware and South Pennsylvania.

Here again viners are set up at strategic points and the local farmers, having co-operated with Seabrook in their planting schedule, seed varieties and fertilisers, bring in their peas and beans for threshing.

It was interesting to note in visiting these areas with the contracts manager how farmers in the vicinity of the vining stations were producing crops on a large scale which had previously never been considered and the beneficial effect of alternate crops was obvious.

Cultivations

When the peak pea production is over at Seabrook, threshed peas are transported by air from North Pennsylvania where the pea season is a few days later.

Within a few days of harvesting, pea fields are disced and cultivated by caterpillar tractor drawing discs and marker harrows in one unit and are sown with Lima beans at 32-45lb. an acre in rows 28in. apart. Kidney beans are sown at the rate of 80-100lb an acre.

Beet is sown thickly after the seed has been graded for size and treated with graphite to ensure an even flow from the hoppers, and is harvested when small by Scott beet harvester.

Spinach is sown following peas on a cover crop at 8-12lb. an acre and is harvested by the Porter Way with adapted cutter bar.

Weeding

Row crop cultivation is done mostly by Farmall tractors with tool bars mounted forward and between the axles so that the implements are in full view of the operator. The tools are mounted on the toolbar to give close, shallow cultivation and in operating cover small weeds growing in the rows.

Tractor wheel marks are erased by rear mounted cultivators. Hand labour for weeding is scarcely ever necessary.

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● **Only a few inches of topsoil stand between the human race and oblivion.**

What's Wrong with the World?

From Country Life, Canada

THE world food situation is none too bright. Solution of the problem emphasises not only Ruskin's memorable dictum: "If you want food you must toil for it," but the need, too, for understanding and education and co-operation. This means that we must realise how utterly dependent we are upon the earth and its fruits. Canadians have a country which by virtue of the gifts of Providence is one of the largest suppliers of food to the world market. While many other countries have skidded far down the road toward national suicide by destroying the soil which alone makes possible their survival, we have still time to save our soil and expand its usefulness.

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When we look at what has happened on other continents we see that the extractive farming pursued by man has milked the soil and exhausted his environment. Soil erosion follows soil exhaustion. The early home of Chinese civilisation, as is said in "Vanishing Lands," a book by Jacks and Whyte which did much to awaken interest in conservation, now resembles a battlefield scarred by forces far more destructive than any modern engines of war, through which the Yellow River transports an annual load of 2,500 million tons of soil.

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Is man really wise? He is building rocket ships in which to fly from this planet to some others. Unless he improves his food supply he may need his space ships, but he has no guarantee that he will find a better source of food supply on any other world. Perhaps, as was suggested in a recent Montreal Gazette article one may ask whether man needs to escape the earth or get down to it.

★

Erosion is the serpent of our food production garden. Over immense areas of the world, precious topsoil has been wholly or partially lost, or is threatened with removal. It took ages to build up its balance between climate, microbes, plants and trees.

★

Only a few inches of topsoil stand between the human race and oblivion. It is the one natural resource besides air and water without which human life cannot exist. The land is not only a source of life-sustaining food, but the base of our economy. It stores up energy and releases it when we need it. Knowing its capabilities, treating it according to its needs, using the proper method of cultivating it, conserving its goodness: these form the basis of the farmer's responsibility to the land. But the city man is equally concerned, because no matter what his business may be he depends absolutely upon the soil for what he eats.

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The Soviet Union, according to a calculation made in 1941, had 388 million acres under cultivation, giving an average of 2.3 acres per person, compared with Canada's 5 acres per person.

Those who have read Pearl Buck's books know intimately the struggle for existence of China's farmers, each on his tiny lot. China needs more of everything: 60 per cent more fats and oils, 327 per cent more fruits, 50 times the milk she now has, just to reach a minimum standard of diets. During the past century, says Vogt, it is estimated that 100 million people have starved to death in China.

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Or take India. A report to the United Nations says that in normal times 30 per cent of the population, representing 100 million people, do not get enough food of any kind. Contrasted with the Canadian 1947 level of daily calories, which was 3219, the average daily caloric intake of a group of villages in South India was only 1700, and that of poor families in a Madras suburb 1800.

★

So much for the Far East. Turn to Europe. Before the war, most countries imported food—the United Kingdom to the extent of 50 per cent. In the Balkans, children now dig soil from rock crevices with teaspoons and add it to the fields; in the Vosges region soil washed into the valleys is carried back in baskets and replaced on the farms. The average farm in Greece has nine acres.

★

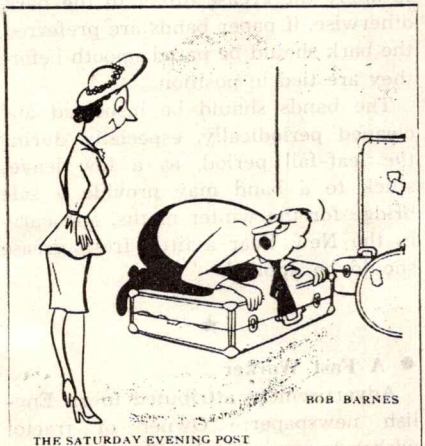
Africa cannot support a large population. It offers, says Vogt, the lowest carrying capacity per square mile of any continent. With only 20 million more acres of cultivatable land than South America, it already has 70 per cent more population.

★

So there is the story of the world's present situation in regard to food, and of some of the factors causing it. The causes include lack of attention to land usage and lack of expenditure on land care; erosion; depletion of needed chemicals; faulty cropping; pests and waste. And there is one inescapable fact: there is no more land on earth than is known to us today.

★

There are other frontiers, of course. Science can, perhaps, come to our rescue, as it turns out to be as successful with plant and animal diseases as with human diseases. It may develop cold-resistant grains with which we may push our grain fields nearer the poles; and drought-resistant grains which will open up farming in dry regions. It has even been suggested that food plants of some kind may be grown on the ocean floor. But suppose by all this we increase production 20 per cent, we still are faced with a predicted 100 per cent growth in population in the next century.



THE SATURDAY EVENING POST

"Well, don't just stand there! Bring me the scissors!"

● **Routine control measures will reduce pest damage to a minimum.**

Fruit Tree Pest Control

Get Grease-Bands On Now

From Popular Gardening, England

NO single operation will rid our fruit trees completely of the insect pests that infest them, but if we work to a programme of routine control measures, supplemented by emergency measures, if, and when, these become necessary, we shall be able to reduce pest damage to a minimum; and the first general control measure, to be attended to without delay, is that of grease-banding.

The special purpose of grease-banding is to catch the female winter moths, the caterpillars of which do so much damage to the young foliage and fruitlets in spring. These female winter moths lay their eggs during autumn and winter on the branches of apples, pears, plums and other tree fruits, so that when they hatch out in spring the caterpillars have their food ready to hand, as it were.

Fortunately, the female moths are wingless, or at least their wings are so poorly developed that they have to crawl from the ground up the trunk of the fruit tree to the branches, and the idea of grease-banding is to catch them on the way up, before they have a chance to lay their eggs.

Grease-bands can be purchased ready-prepared, and some types of "grease" are now marketed which the makers claim are safe to apply direct to the trunk of the tree. The usual method, however, is to wrap bands of grease-proof paper, about six inches wide, round the trunk, and tie them tightly with string about half an inch from the top and bottom edges.

A good proprietary "grease"—the tackier it is the better—is then applied to the paper band in a thin even layer, so as to completely encircle the trunk with a barrier on which the moths will become stuck. The grease-band should be fixed not less than two feet from the ground, otherwise soil splashing may render it useless.

In the case of bush trees that branch low down, it is often best to band the individual main branches, and young trees that are staked should, for obvious reasons, have the stakes as well as their trunks grease-banded. With old rough-barked standard trees it is safe to apply the grease direct to the bark, otherwise, if paper bands are preferred, the bark should be pared smooth before they are tied in position.

The bands should be inspected and cleaned periodically, especially during the leaf-fall period, as a few leaves stuck to a band may provide a safe bridge for the winter moths, and early in the New Year a little fresh grease should be applied.

★

● **A Fast Worker**

Advertisement attributed to an English newspaper: "Owner of tractor wishes to correspond with widow who owns a modern thresher; object matrimony. Send photograph of machine."

● **Fungus disease common on tomatoes and potatoes has been causing damage to apricot trees in the Alexandra district.**

Verticillium Wilt of Apricots

By L. R. Renouf, Orchard Instructor, Alexandra, N.Z.

VERTICILLIUM WILT, a fungus disease common on tomatoes and potatoes, has been causing damage to apricot trees in the Alexandra district during the past few years.

Verticillium Wilt is caused by the fungus Verticillium dahliae Kleb. Infection occurs through the roots of the trees; the fungus grows up through the branches and, once established, causes extensive damage.

Symptoms of Disease

The first indication of the presence of the disease in apricots is the yellowing of foliage on the lower parts of yearling wood, from 9in. to 18in. usually be affected. This foliage drops and bare parts are then conspicuous. The most upright-growing young wood is the first affected.

At this stage the tops of new growths still appear healthy and growth is carried on, but if the wood is cut, it shows discoloration, which varies from light browning at the tops and increases in darkness downward into older wood. Very dark discoloration shows in wood four years old and older.

Usually only part of the tree is affected, but sometimes the whole tree will show the trouble at one time.

If the disease intensifies, wilting of the top foliage occurs, followed by wilting and dying of branches. As a result whole leaders or even whole trees may die, but often branches die part way down and the growth below appears healthy, though discoloration will show in the wood.

Branches may also be affected and not die. When this occurs it will be found that the season after the first appearance of infection growth will be weak, bare parts will be in evidence, and affected parts will appear sickly.

Infected trees may then grow in a normal manner, but leaders are bare for several feet, thus considerably reducing the carrying capacity of the trees. Discoloration of the wood will still be noticeable, indicating that the disease is present and likely to show up in more damaging form.

The extent of the damage caused by this disease can be seen in several orchards in the Alexandra district. In one orchard 96 trees in a block of 300 five-year-old trees were showing infection in the autumn of 1947 and several others had previously been taken out. In 1945, 72 trees in this block were showing the trouble. In another block of 275 six-year-old trees 58 were showing infection in the autumn of

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1947 and more than 100 trees have been replaced over the past few years. The infection has increased each year in these orchards, and the final extent of the damage cannot be estimated.

Most of the infected trees are from three to ten years old, but the disease has been found on trees up to 20 years old.

Cause of Infection and Control

Verticillium Wilt fungus is carried over in the soil, and in each instance where infection has been found tomatoes have been grown in the ground either before apricots were planted or between the trees after planting. It is by this means that the fungus has been introduced.

Once the disease is established in an orchard there are no means of eradicating it. Sterilisation of the soil, the only efficient way of eliminating the trouble, is not practicable under orchard conditions. Where infected trees have to be removed the ground should be either left fallow or replanted with trees other than apricots.

As the obvious source of infection is from tomatoes, apricots should not be planted in ground previously used for growing tomatoes and tomatoes should not be planted among apricot trees.

★

● **Inbreeding does not produce defects. It merely concentrates weaknesses already in the stock.**

Inbreeding Improves Flock

Capper's Farmer, U.S.A.

MANY poultry raisers who hatch eggs from their own hens use breeding cockerels from an unrelated flock each year to prevent inbreeding. C. R. Doebel, Worth county, Iowa, disagrees. His Barred Rocks have been closed to outside blood for 15 years.

"Inbreeding does not produce defects," Doebel said. "It merely concentrates weaknesses already in the stock and makes it possible to weed them out. That's the way superior parent stock for hybrid corn was produced. The plant breeder throws away strains that show a weakness and keeps the strong ones. By crossing strong with strong, he gets a superior product.

"Our breeding work with chickens was started to eliminate faulty feather markings. We did that in a few years. We also elmininated faults that are of greater importance, such as low production and poor body conformation. Now our hens are as alike as peas in a pod. They average 185 to 200 eggs apiece in their pullet year. The hatcheryman tells us hatchability and livability are higher than from any other flock that supplies him eggs.

"We have greatly increased egg size by selection. There are now less than 1 per cent barebacks, and all young chicks are fast growers, mature early and show great vigour.

"There is another advantage in maintaining a closed flock. All ancestors of our chicks have been on the farm for years, and they have developed a high immunity to all diseases that have been introduced on the place."

● **Importance of thinning for proper fruit size—Pruning not satisfactory for control of fruit numbers—Irrigation, fertilisers, pest and disease control. Successful field day at Tatura (Vic.)**

Peach Culture

From The Fruit World and Market Grower

CANNING peach culture was the main topic of discussion at the recent Annual Field Day at the Government Horticultural Research Station, Tatura, Victoria.

Mr. F. M. Read, Chief Inspector of Horticulture, who recently visited California, said that the subject of fruit size in relation to canning peaches was of major importance. There was a high correlation between the size of fruit ten days after stone hardening and the size of fruit at maturity. As a result of work extending over a period of more than 15 years, the main canning companies now sent a team of men through the peach orchards about 10 days after stone hardening to take careful measurements of fruit size. From the tens of thousands of observations made, it was possible to be accurately advised concerning the amount of thinning required to obtain maximum crops of peaches of canning size.

The following are summaries of lectures (vide "Vic. Jour. Agric.") given at the field day:—

The Growth Periods

In understanding the factors affecting fruit size, it was necessary to know the changes which occur during the three main growth periods. During the first eight weeks after fruit setting, growth was fairly rapid, but, during this period, there were three separate waves of dropping due to unsatisfactory fertilisation of the embryo. Fruit which remains until harvest time, unless removed by wind, hand-thinning, etc.

At the end of this first period the stone had reached maximum size but had only a thin layer of flesh. Then the outward growth of the peach almost stops for a period which, in the Golden Queen, is 10 to 11 weeks. For early varieties this period was shorter, and for later varieties, longer. Early in this period the stone hardens and later the kernel becomes fully developed. Rapid growth of the peach up to picking time then occurs. For the Golden Queen this last period was of about five weeks' duration, and commences about the first week in February. The fruit almost doubles its size during this final swell.

Effects of Fertlisers, Pruning and Thinning

In the peach fertiliser trial at the Station, rates of application of 6lb. and 3lb. per tree were compared in an attempt to discover the most economic application.

Trees receiving a higher dressing made more shoot growth in 1947, but this difference was unwittingly removed as a result of slightly heavier pruning of high-nitrogen trees, so that these trees carried a crop of about the same size as trees receiving a lower dressing.

The point arises here that there is a definite relationship between the number of shoots and the size of crop when "distance" thinning is practised, so that **trees which receive fertilisers and produce more shoots should be**

encouraged to produce bigger crops by lighter pruning.

By dividing the sulphate of ammonia into two separate applications in August and February, more and longer laterals were obtained, and the following season a greater crop of fruit.

The higher nitrogen dressing had no immediate effect on fruit size. If it had, the February dressing of sulphate of ammonia would have produced a much bigger effect on the fruit crop, and the "high nitrogen" trees would have out-yielded the "low nitrogen" trees.

Fruit size depends partly on the number of leaves, about 80 leaves per fruit being required for best growth of peaches. Good irrigation and fertiliser practices give good shoot and leaf growth, which result in good fruit size.

In the fertiliser trial, superphosphate and potash applications have not produced any consistent effects.

The size of the fruit is also controlled by the number left on the tree. The greater the number of fruit on the tree the greater the total weight of fruit. The weight of fruit of canning size also increases with the total number up to a certain stage, and then falls away as the number of undersized fruit increases. A tree carrying 10 to 15 per cent of undersized fruit at harvest time carries the most profitable amount of canning fruits. The number of fruit to be left on each tree depends on variety, vigour, soil fertility, and water supply.

Pruning is an unsatisfactory method of controlling fruit numbers, and hand thinning for the Golden Queen variety is the most satisfactory. The best time to thin is from mid-November onwards after the last natural drop has occurred. At this stage it is possible to observe the differences in size which will persist until harvest, and it pays, therefore, to remove the smallest fruits. Thinning by "distances" does not give good control of fruit numbers, so thinning should be guided by actual sample counts.

Growers should estimate tonnage which trees can carry, and allow 100 to 110 fruits per tree for every two tons per acre for average size of 2½in. fruit. For example, a 10-ton crop requires about 550 fruits per tree on an 18ft. x 18ft. planting. Some average-sized trees should then be thinned to this number, and the number checked by counting. Regular spacing of the fruit is not important. These average trees will then serve as a guide for thinning the rest of the block.

Pests and diseases, such as Aphis, Mites and Rust, are factors which, if not properly controlled, will also affect fruit size.

Effects of Water Supply on Fruit Size

On the experimental peach irrigation block, detailed circumference measurements of individual fruits are made throughout the season. It has been found that, as soon as there is a shortage of soil moisture, the fruit stops growing even before the tree shows any signs of wilting, and if the

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soil remains dry for four to five days the fruit starts to shrink. The size lost during these periods of moisture shortage is not made up during the remainder of the season.

If the "no-growth" period amounts to 10 or 12 days, it may not matter very much. However, on most orchards where difficulty is experienced in getting the fruit up to size it is probable that the fruit has had a total of 25 to 30 days of "no-growth."

If the soil is tight and impermeable, difficulty is experienced in obtaining satisfactory water penetration, and, unless some means are available to forecast the irrigation requirements of the tree, it is quite likely that the number of no-growth periods will add up to 30 days.

On more permeable soil types which are wetted to about 2ft. and take about 4in. of water from each irrigation, there is less likelihood that the fruit will stop growing.

On the irrigation block of Golden Queen Peaches at the Station penetration is extremely difficult, and the soil is wetted to an average depth of 10in. in the summer. It has been found that on this block the fruit stops growing when water loss from an evaporimeter is 3in. Daily evaporation figures, which vary from .2in. on a mild day to ½in. on a hot, windy summer day, when added up from the date of the last irrigation can be used on this property to predict the time for the next irrigation. The irrigation interval is usually seven to 10 days in midsummer However, until a survey of permeability is made throughout the district, this method cannot be used for general forecasting of irrigation requirements.

On this block last year the trees were thinned to carry a heavy crop with about 10 to 15 per cent undersize, according to the method previously outlined, and irrigation was applied according to fruit measurements. Ten irrigations used took a total of 18in. of water, and the result was a 12-ton per acre crop, 85 per cent being of cannery size. This heavy crop does not appear to have affected this season's crop, and it is intended to continue to crop the trees to capacity.

An experiment to improve penetration is in progress, and the whole block has been laid out with various treatments, which include permanent covers of White Clover, Lucerne, and Subterranean Clover, weed control by summer cultivation and kerosene spraying, winter cover crops, and miscellaneous summer herbage.

The kerosene-sprayed uncultivated plots are looking healthy, probably because of the extra 3in. of soil which is available to the tree roots without other competition. Plots sown down to permanent leguminous cover require extra nitrogen, and applications of 2½lb. and 5lb. of sulphate of ammonia per tree in both August and February are being compared. This experiment is of a long-term nature, and it is not expected that the effects will be gauged for a number of years.

Summary

Control of fruit size depends principally on three things:—

1. Control of number of fruit on a tree, chiefly by thinning, according to its capabilities.
2. Control of water supply to ensure continuous growth of the fruit.
3. Control of pests and diseases.

★

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Nothing is more dishonourable than an old man, heavy with years, who has no other evidence of having lived except his age.—Seneca.

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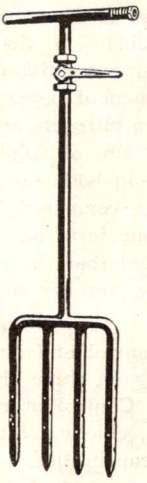

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● **The mysterious virus diseases, and steps being taken to overcome them, are discussed in this article.**

Mysterious Virus Diseases of Plants

From The Fruit and Vegetable Review

MUCH concern is being felt throughout fruit producing areas over the increased number of new and devastating virus diseases which are reducing crop yields and killing fruit trees. This concern is bolstered by grim legends of the losses accompanying the periodic epidemics of peach yellows during the 1880's in eastern United States, and reminds us what virus diseases can do if left uncontrolled.

Before going into the details of the problem, it is essential that certain basic facts be understood regarding the nature of viruses and the manner in which they produce disease. To most growers virus diseases are something mythical. This is understandable when they see their trees, often the most vigorous ones, which have grown normally for a long time, suddenly develop off-type fruit or foliage or die without any apparent reason. Enough is now known about this group of diseases that they can be explained on the basis of a parasitic cause in the same way as those caused by bacteria and moulds.

Viruses differ generally from bacteria, being smaller in size and unable to live and multiply outside of the hosts they infect. In the orchard they usually are spread from tree to tree by insects. These insects suck juice from diseased trees, migrate to healthy trees, and while feeding, leave some of the juice obtained from the diseased tree, thereby infecting the healthy one.

Multiplies Rapidly

Once inside the new tree the virus grows and multiplies and becomes distributed in the tissues. Diagonsis in the orchard is chiefly by recognition of characteristic symptoms on the host plant, and reproduction of these symptoms in a previously healthy plant by grafting it with tissue from the diseased plant.

No fruit tree virus has been transmuted mechanically from tree to tree with infected juice; therefore, it is unlikely that they can be spread by any cultivation procedure, such as pruning, spraying, thinning, tillage, etc. Only one —ring spot—has been shown to pass from an infected tree through its seeds to the seedlings. Inter-area spread usually takes place in nursery stock or graft wood. Once established, orchard spread takes place naturally through insect vectors, or through propagation by use of infected graft wood.

Prior to 1930 only five virus diseases —yellows, little peach, red suture, rosette, and phony—were known, which affected stone fruits. All of these occurred in eastern United States, and were considered as primarily affecting peach. Little peach and red suture developed in the same area as yellows, and have symptoms sufficiently similar to those of yellows that they are considered to be caused by strains of the yellows virus. Rosette is also of the yellows type, but occurs in a different geographic region and has such strikingly different symptoms that it is

considered unrelated to yellows. All of these diseases are now secondary in importance, largely because they are well known by growers, nurserymen, and regulatory officials and are closely rouged from orchards. Little peach and red suture are currently more serious than yellows, principally because of greater difficulty of diagonsis and prompt removal.

Tremendous Losses

Th phony disease, fifth of the original group, is still of prime importance, and the cause of tremendous losses in south eastern United States. Since 1929, over 1,500,000 diseased trees have been removed. The loss is not limited to the crop loss on these trees, and the cost of tree replacement; to this must be added the cost of inspection, diseased-tree removal, loss of scattered trees in orchards where stands become too sparse to maintain, etc. Without the control programme of diseased-tree removal and thereby removal of sources from which spread can take place, the disease, unchecked, doubtlessly would have invaded and ruined peach culture in most areas of southern and central United States. Yet, with the best efforts of the control programme, the annual loss is still between 60,000 and 70,000 diseased trees.

The phony disease does not kill peach trees. Diseased trees are dwarfed, but usually are darker green in colour and appear more dense than normal. First, size is reduced sharply, and after the second year of the diseases, few fruits are marketable. Formerly, all information indicated that the casual virus was limited to the roots, but new information indicates that the virus is occasionally in portions of the top from which the insect or vector can pick up. The incubation period following inoculation with diseased scions is 18 to 36 months. It is likely that insects can pick up the virus from normal-appearing trees part way through the incubation period, which in part, helps explain why diseased-tree removal has not reduced the incidence as fast as hoped.

250,000 Trees Destroyed

The sixth stone fruit virus disease recognised was peach mosaic, discovered in Central Texas in 1931. It produces yellow mottled patterns in the leaves, dwarfing of twigs, rosetting of foliage, and reduction in yield and quality of fruit on many of the freestone varieties of peaches, particularly Elberta and J. H. Hale. Since a high percentage of the freestone acreage is Elberta, it was decided to attempt eradication by removal of all diseased trees. Between 1935 and the present time approximately 250,000 diseased

Weeds

A cause of great worry to the orthodox farmer and gardener, weeds are a joy and a boon to the compost cultivator. Weeds are one of the most prolific sources of high quality vegetable matter for the compost heap, and it is very satisfying when a patch of ground has produced weeds so rapidly that it can no longer be coped with, to know that they can be used to increase future production of the crop which they may this year have swamped out. I had a crop of early carrots which this year were beaten by weeds at a time when it was too wet to hoe. There was a terrific crop of numerous varieties of herb and weed which gave high quality to the compost heap and proved no less remunerative in the long run than the carrots which they smothered.—The Farmer, England.

trees have been removed. During this period, extensive surveys revealed the disease widespread in all of the south western States and Mexico. Eradication now appears economically impossible.

The present methods of control are by regulating all nurseries within the infected area to prevent further spread within and to areas outside. Control by diseased-tree removal is being carried on in certain local areas where the varieties desired are ones which would be seriously damaged.

Next came the X-disease of peach, first seen in Connecticut in 1933. The term X representing an unknown quantity, was applied to the disease because of its unprecedented and peculiar behaviour. Diseased trees appear normal until about mid-summer, when within a few days leaves on affected twigs become progressively pale in colour, roll upwards, become brittle and develop red to yellow colured areas some of which drop out. Leaves on affected twigs usually are shed beginning at the base and progressing towards the tip. Fruit on affected twigs usually shrivels and falls soon after leaf symptom development. Although the disease seldom kills trees entirely, they are rapidly rendered unproductive.

X-disease introduced a new feature in stone fruit virus diseases in the way of a specific relationship between hosts. It was found to infect the native chokecherry, Prunus virginiana, on which it causes a brilliant array of red and yellow colours. It has spread rapidly in this host across eastern and central United States, and stands as a menace to peach and other hosts. Sour cherries have been found affected by the X-disease virus, which raises a new threat. Affected sour cherries are ruined, and many die. No picture of the seriousness of X-disease is complete without inclusion of the western form, called western X-disease; and its possible connection with the little cherry disease.

Most Serious Peach Disease

The symptoms of western X-disease on peach are nearly identical with those of the eastern form. It is considered separately, for the present, chiefly because spread of the western form apparently takes place from peach to peach without proximity to chokecherry. Western X-disease is the most serious disease of peach in western United States, and estimates have placed the annual loss at upwards of 500,000 dollars. Some orchards in southern Idaho and central Utah and The Dalles area of Oregon are nearly 100 per cent affected. Surveys in

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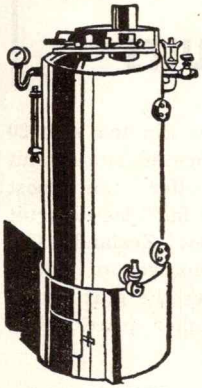

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Washington conducted in 1942 and 1943 showed 1.8 per cent of all the peach trees in the State affected.

The name "little cherry" was first applied to a trouble on sweet cherries in the Kootenay Lake area of British Columbia. The disease spread so rapidly that after 15 years nearly every cherry tree in the area was affected. A condition also termed little cherry has been found in Oregon and Utah on sweet and sour cherries, which appears to be related to the western X-disease occurring on peach in the respective places.

In 1946, little cherry comparable to the British Columbia form was found in Washington. It is not known whether the Washington and British Columbia forms can infect peach. The buckskin disease of sweet cherry, known in California since 1933, produces fruit symptoms of the little cherry type on sweet cherry and western X-disease on peach. In British Columbia and in Washington the chief symptoms are failure of the cherries to size and mature. Affected trees are not killed, do not develop die back or show loss of vigour.

In Oregon, affected trees respond variously, sour cherries particularly declining rapidly, and many trees die. In Utah, both sweet and sour cherries decline, and the majority of trees on mahaleb rootstock are killed. The variable reaction of cherries in the different regions is probably due to the presence of different forms of the virus. The very rapid rate of spread of little cherry in British Columbia makes any comparison to that occurring in the United States alarming.

Cherry Disease

One more disease, which merits special consideration is sour cherry yellows. This disease is widespread throughout the sour cherry areas of United States and Canada, and had been present in sour cherries a long time when shown by Keitt and Clayton in 1939, to be caused by a virus. Affected trees are not killed, but are reduced in vigour and fruit production. Estimates based on surveys in Wisconsin and other areas indicate that one-third of all the sour cherries now standing are affected. In well-established cases, fruit production is reduced 50 per cent on diseased trees, which would indicate at least a 15 per cent annual crop loss. Using Bureau of Agricultural Economics figures for 1946 of 117,250 tons, worth 301 dollars per ton, this gives the staggering figure of over 5,000,000 dollars annual crop loss in the United States alone.

This disease is of the insidious type, in which diseased trees are not killed

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but stand as a source from which further spread takes place. Although spread is not considered rapid as compared to peach mosiac or the phony disease, the relatively long life of sour cherry orchards affords time for a high percentage of the trees to become infected. Since diseased trees produce some fruit, and in some cases even larger sizes than on unaffected trees, growers are reluctant to accept any clean-up programme. In the warmer areas, symptoms are masked in affected. Symptoms are likewise masked in nursery stock grown in these areas. Attempts are under way to produce and supply nurserymen with disease-free budwood.

Control Problem

The problem of control virus diseases can be divided into two phases: (1) Prevention by exclusion—if you don't have them, keep them out—and (2) if already present, they can be either eradicated or reduced to a low incidence by a control programme through removal of diseased orchard trees and planting only clean nursery stock. If the rate of spread is so rapid that these two methods are impractical, other means such as use of tolerant or resistant varieties, growing orchards under isolation, control of insect vectors, use of mild forms of the virus to protect trees against the severe forms, etc., have to be considered.

The varying characteristics of each disease make the problem a singular consideration. It is essential before control procedures can be planned to have such basic information as rate of spread; relative amount of damage caused to the host plant; percentage of plants affected; host range, particularly symptomless hosts; insect vectors; incubation period; and other pertinent facts. No application of sprays or other treatment with chemicals, fertilisers, or other materials has resulted in the cure of a virus diseased fruit tree in the orchard and assisting nurserymen to obtain clean budwood.

In addition, they are attempting to obtain and assemble virus-free clones of the commercial horticultural varieties of stone fruits. These will be maintained in an isolation station, from which stock can be supplied to the trade. Oregon also is assisting nurserymen with a virus-free registry system in which virus-free trees are located and labelled for use by nurserymen. Nurserymen are encouraged to use such sources for establishing their own mother blocks in preference to taking wood direct from orchards.

Uniform Control Needed

New York, Michigan, and several of the central states are instituting procedures to assist nurserymen in their respective states to obtain clean stock. At present there are few statutory provisions to prevent movement of nursery stock from some of the areas where diseases are known to be present. Prevention of carrying the diseases in such movement depends on the integrity and knowledge of the nurserymen and the assistance they can get from extension, research, and regulatory men.

Research and regulatory workers need the assistance of observations made by growers who know and live with their trees. Growers should report abnormal trees to their county extension men or to research men. Co-operate efforts among regulatory officials, growers, and research men are necessary to devise successful control procedures.

There is need for a uniform programme for certification of nursery source material free of virus and virus-like diseases.

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A Page or so for the Housewife
conducted by "Margaret Nan"

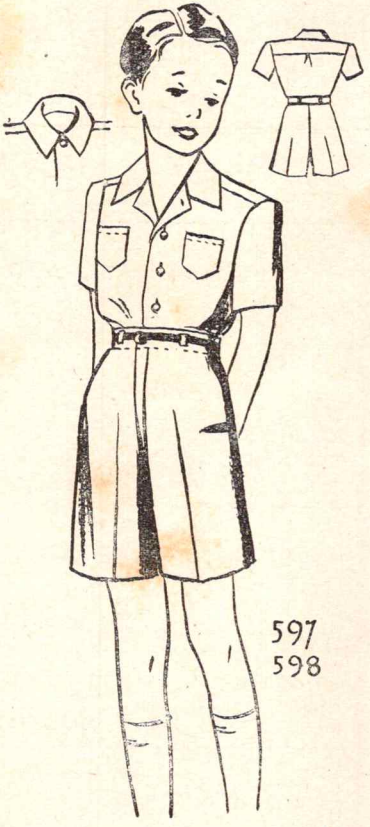
Here are Three Practical Recipes to help make that Morning or Afternoon Tea more Interesting

GINGER PUDDING—2oz. bread-crumbs, 2oz. flour, 2oz. shredded suet, 2oz. preserved ginger, 2oz. sultanas, 4oz. golden syrup, ½ teaspoon ground ginger, small level teaspoon of baking powder, 1 egg, milk to mix. Mix as usual —warm the syrup and add to the dry ingredients. Boil for at least three hours.

GINGER NUTS—½lb. flour, 1 dessertspoon ground ginger, 2½oz. butter, ¼ teaspoon bicarbonate soda, ½ cup of golden syrup, pinch of salt. Melt the butter and syrup, then add all other ingredients. Mix to a stiff paste. Roll out on a floured board. Cut into rounds. Place on a greased baking slide. Bake in a moderate oven for about a quarter of an hour.

GEMS—2 cups flour, 2 eggs, ½ cup of sugar, 1oz. butter, 1 cup of milk, 3 teaspoons baking powder. Beat the eggs and sugar thoroughly, melt the butter, and add. Next add the milk, then the other ingredients. Have gem irons very hot, and grease with butter. Half fill with the mixture and cook in a hot oven. (This makes two dozen gems.)

Patterns by MARGARET NAN



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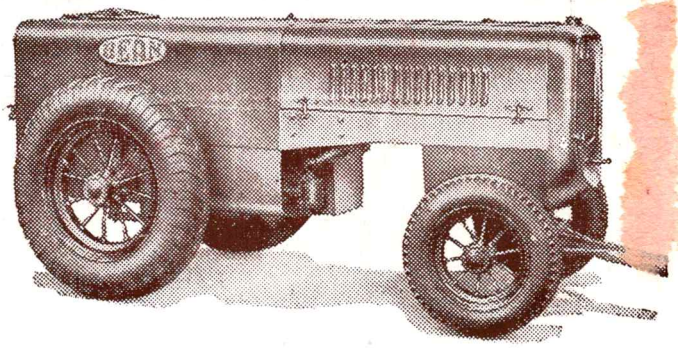

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